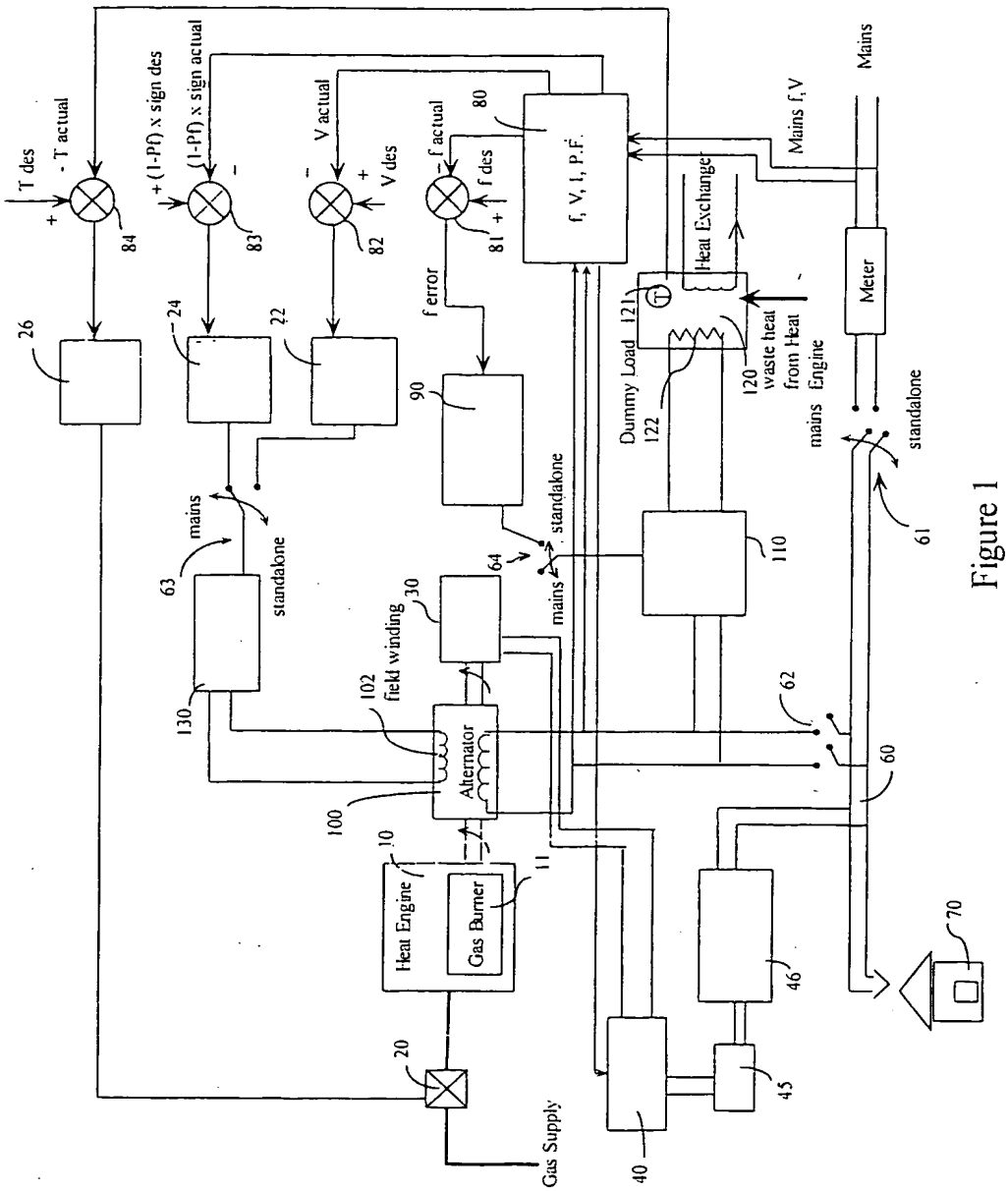
T des
- T actual
+ (1-Pf) x sign des
(1-Pf) x sign actual
V actual
V des
f actual
f des
f, V, I, P.F.
Mains f, V
Mains
Heat Exchanger
Meter
f error
Dummy Load 121
122
120 waste heat from Heat Engine
mains
standalone
mains
standalone
mains
standalone
63
64
61
110
90
26
24
22
84
83
82
81
80
130
102 field winding
30
Alternator
100
62
60
10
11
Heat Engine
Gas Burner
20
Gas Supply
40
45
46
70

Figure 1

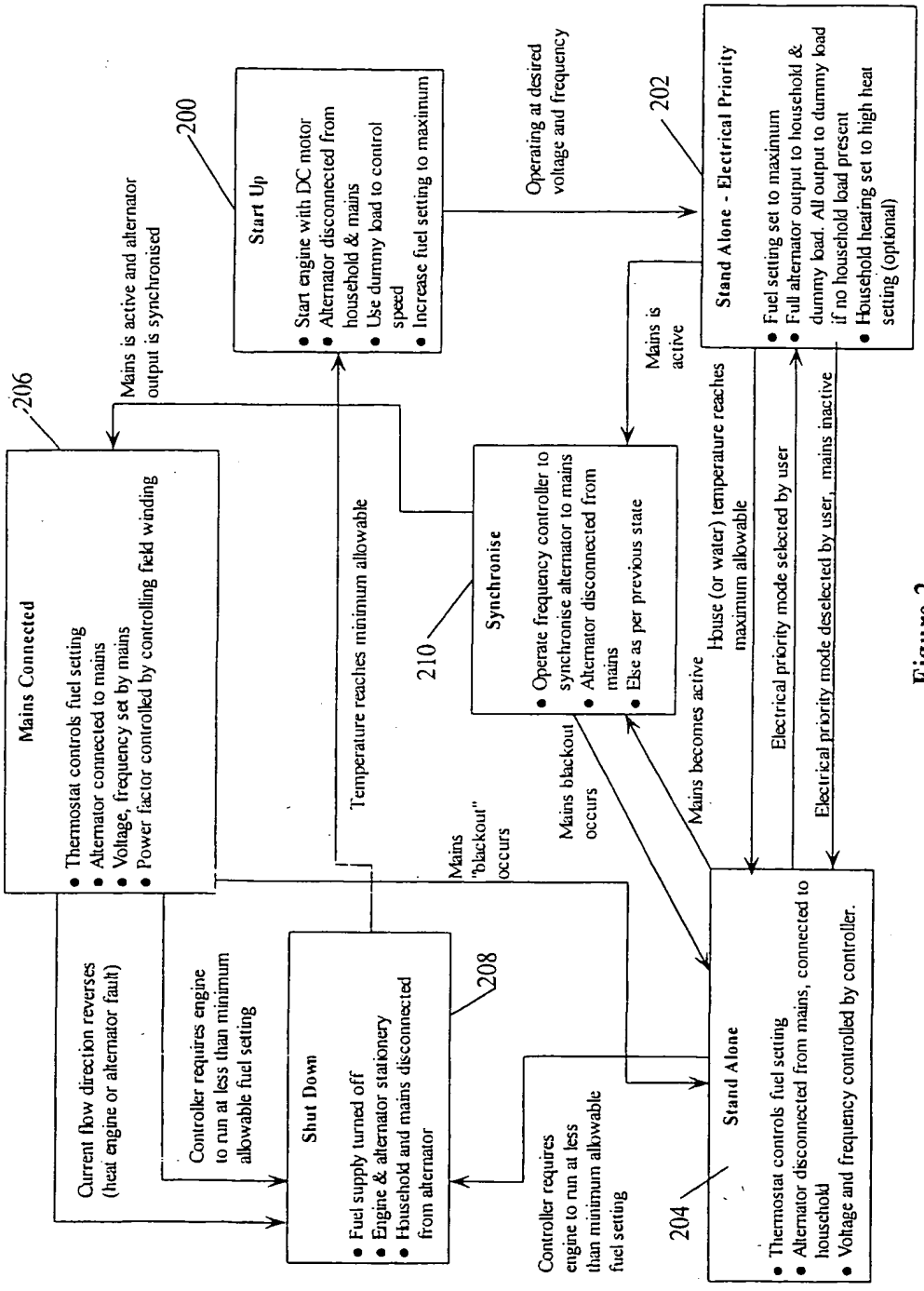
Mains Connected
• Thermostat controls fuel setting
• Alternator connected to mains
• Voltage, frequency set by mains
• Power factor controlled by controlling field winding
206
Mains is active and alternator output is synchronised
Start Up
• Start engine with DC motor
• Alternator disconnected from household & mains
• Use dummy load to control speed
• Increase fuel setting to maximum
200
Operating at desired voltage and frequency
Stand Alone - Electrical Priority
• Fuel setting set to maximum
• Full alternator output to household & dummy load. All output to dummy load if no household load present
• Household heating set to high heat setting (optional)
202
Mains is active
Temperature reaches minimum allowable
Synchronise
• Operate frequency controller to synchronise alternator to mains
• Alternator disconnected from mains
• Else as per previous state
210
House (or water) temperature reaches maximum allowable
Mains becomes active
Mains blackout occurs
Mains "blackout" occurs
Electrical priority mode selected by user
Electrical priority mode deselected by user, mains inactive
Current flow direction reverses (heat engine or alternator fault)
Controller requires engine to run at less than minimum allowable fuel setting
Shut Down
• Fuel supply turned off
• Engine & alternator stationery
• Household and mains disconnected from alternator
208
Controller requires engine to run at less than minimum allowable fuel setting
Stand Alone
• Thermostat controls fuel setting
• Alternator disconnected from mains, connected to household
• Voltage and frequency controlled by controller.
204

Figure 2